



National Weather Service Aberdeen, South Dakota



July 2013

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User Defined Forecast

Have you ever wanted to get a more general "area" forecast? The Weather Service has just released an experimental web-based application called "User-Defined Area Forecast. This application allows you to select your own area of interest from the NWS point and click data base, and extract a forecast for that area.

To select an area within the Aberdeen NWS County Warning Area...click the following link: www.nws.noaa.gov/wtf/udaf/area/?site=ABR

If you are interested in an area other than what the Aberdeen NWS is responsible for, click the following link , then zoom into the area you are interested in: preview.weather.gov/udaf/

new

A Look Back at July

July 2013 was cooler than normal across central and northeast South Dakota along with west central Minnesota. Most locations were near to below normal for rainfall with some locations above to much above normal. Average temperatures were from a half degree to almost three degrees below normal for the month. There was some heat and humidity in the middle of the month, especially at Pierre when they topped the 100 degree mark on July 18th. Kennebec was the wet spot for the month with just over 5 inches of rainfall. Aberdeen received most of its rain for July in one shot from thunderstorms late on the 8th and early on the 9th when they received 2.13 inches of rain. The area also received a cool down at the end of the month when several record low temperatures were broken across the region. Most of the low temperatures on the 27th and 28th were in the lower to middle 40s. Aberdeen almost reached the upper 30s when they cooled to 40 degrees on July 28th. High temperatures were also fall-like in the upper 60s to middle 70s across central and northeast South Dakota as well as west central Minnesota for several days at the end of July. With near normal temperatures for June combined with July's below normal temperatures along with a cooler than normal start to August, the summer may finish out with below normal temperatures across the region.

JULY 2013

Temperature Data	Aberdeen	Sisseton	Wheaton	Watertown
Warmest Temperature / Date	94 / 18 th	91 / 12 th , 18 th	93 / 19 th	89 / 7 th , 12 th , 18 th
Coldest Temperature / Date	40 / 28 th	42 / 28 th	46 / 27 th , 28 th	42 / 27 th , 28 th
Average High / Departure from Normal	82.1 / -1.4	82.0 / -0.9	81.1 / -1.4	80.7 / -1.9
Average Low / Departure from Normal	58.1 / -0.9	59.2 / -0.3	60.8 / +0.1	59.5 / -0.1
Monthly Average / Departure from Normal	70.1 / -1.2	70.6 / -0.6	71.0 / -0.6	70.1 / -1.0
Precipitation Data				
Monthly Precipitation / Departure from Normal	2.70 / -0.32	2.80 / -0.78	2.42 / -0.78	2.79 / -0.23
Most Precipitation in 24 hours / Date	2.13 / 8-9 th	1.74 / 9 th	1.08 / 15 th	1.66 / 14 th

Temperature Data	Pierre	Kennebec	Mobridge	Timber Lake
Warmest Temperature / Date	101 / 18 th	97 / 18 th	95 / 11 th	95 / 11 th
Coldest Temperature / Date	44 / 27 th	43 / 27 th	47 / 28 th	45 / 27 th
Average High / Departure from Normal	86.1 / -2.7	86.2 / -3.5	83.4 / -2.4	85.1 / -0.9
Average Low / Departure from Normal	59.9 / -2.0	59.4 / -2.6	59.1 / -0.4	58.5 / -1.2
Monthly Average / Departure from Normal	73.0 / -2.4	72.8 / -3.1	71.3 / -1.3	71.8 / -1.0
Precipitation Data				
Monthly Precipitation / Departure from Normal	2.58 / -0.03	5.03 / +2.54	2.56 / -0.14	3.31 / +0.69
Most Precipitation in 24 hours / Date	1.67 / 7 th	2.05 / 7 th	1.06 / 14 th	1.31 / 7 th

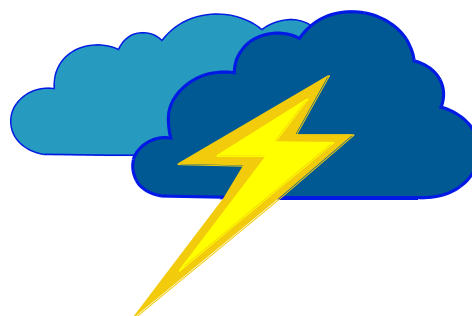
Warnings...How Do We Compare to Last Year?

We've all heard the saying "If you don't like the weather in South Dakota, wait 5 minutes". The weather can change very quickly across the state, especially in the spring. We also know that there can be wide variances of weather from west to east, with severe weather occurring in the east, and wintry weather occurring across the west. Given this variability, how do the months of May, June and July of the current year stack up against the same months one year ago, and against normal values?

	Severe Thunderstorm Warnings issued	Tornado Warnings issued
May, June, July 2013	107	12
May, June, July 2012	135	10
May, June, July Normal	138	18

So from the table above, we can see that this year is below normal when looking at both the number of severe thunderstorm warnings and tornado warnings issued. There could be a variety of reasons for this, although the most likely reason could be the weather pattern itself. Spring and summer arrived rather late this year, and even though we have had a few hot and humid days, we haven't had the prolonged hot and humid weather, which in turn sets the stage for the large severe weather days.

We are heading into a normally "calm" period when it comes to severe weather, so odds are that we will continue to remain below normal when looking at the number of severe thunderstorm and tornado warnings. But, you know what they say about South Dakota weather.



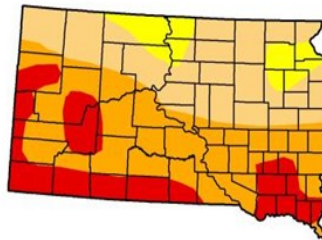
What a Difference a Year Makes

Last year at this time, much of the central and northern plains were sweltering under the hot summer sun, with very little in the way of rainfall seen. Within a year though, much of the region is now out of drought conditions...or has improved greatly over the conditions a year ago. Below are side by side images of the drought today versus this time last year.

U.S. Drought Monitor South Dakota

July 24, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D1	D1-D2	D2-D3	D3-D4	D4
Current	0.00	100.00	91.99	59.15	20.38	0.00
Last Week (07/17/2012 map)	0.00	100.00	90.37	44.93	0.00	0.00
3 Months Ago (04/24/2012 map)	39.81	60.19	34.10	0.00	0.00	0.00
Start of Calendar Year (12/27/2011 map)	48.14	51.86	13.86	2.11	0.00	0.00
Start of Water Year (09/27/2011 map)	71.37	28.63	7.36	0.00	0.00	0.00
One Year Ago (07/19/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00



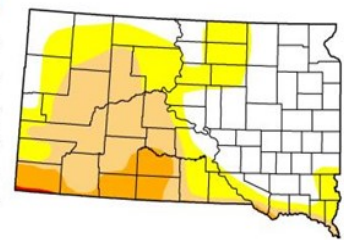
Intensity:

D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional

U.S. Drought Monitor South Dakota

July 23, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D1	D1-D2	D2-D3	D3-D4	D4
Current	41.62	58.38	32.31	7.37	0.23	0.00
Last Week (07/16/2013 map)	41.62	58.38	32.31	7.37	0.23	0.00
3 Months Ago (04/23/2013 map)	0.00	100.00	87.74	66.01	29.03	0.00
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	96.95	63.17	30.68
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	74.69	50.53	6.72
One Year Ago (07/17/2012 map)	0.00	100.00	90.37	44.93	0.00	0.00



Intensity:

D0 Abnormally Dry
D1 Drought - Moderate
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D4 Drought - Exceptional

So what happened? Generally speaking, the upper flow pattern changed. Last year we had a dominate ridge of high pressure located across the central part of the country. This kept a lot of moisture from streaming northward out of the Gulf of Mexico, and allowed the center part of the country to bake under full sunshine. However, beginning in the Fall of 2012 and continuing through this spring...the dominate ridge has been replaced with a more "zonal" flow pattern. This means that systems that come onshore across the west move more west to east across the country. Moisture is able to stream northward out of the Gulf of Mexico, and we have experienced more precipitation. The table below shows the difference in rainfall for May, June and July of 2013 versus the same months for 2012.

Station	May '12/May '13	June '12/June '13	July '12/July '13*	Totals '12/'13
Aberdeen	1.11"/4.32"	1.27"/2.20"	2.22"/2.37"	4.60"/8.89"
Watertown	3.08"/3.23"	5.06"/5.51"	0.55"/2.35"	8.69"/11.09"
Pierre	2.04"/4.17"	2.03"/2.96"	.68"/2.41"	4.75"/9.54"
Mobridge	2.90"/4.63"	1.83"/1.32"	2.26"/2.24"	6.99"/8.19"
rainfall totals as of July 24, 2013				

As you can see from the table above, all of the main reporting stations are ahead, or much ahead in some cases, of where they were last year at this time. This moisture has also prevented a lot of sites from seeing triple digit temperatures this year. The million dollar question is if this is any type of indicator of what the winter of 2013-2014 will be like. Right now it is too soon to say, so stay tuned.

Hail Scars As Seen From Space

The 250-meter "false color" image was taken from the MODIS satellite imager on July 17th. Hopefully a few geographic features stand out - such as the Missouri River, glacial lakes region of South Dakota, City of Aberdeen, etc.

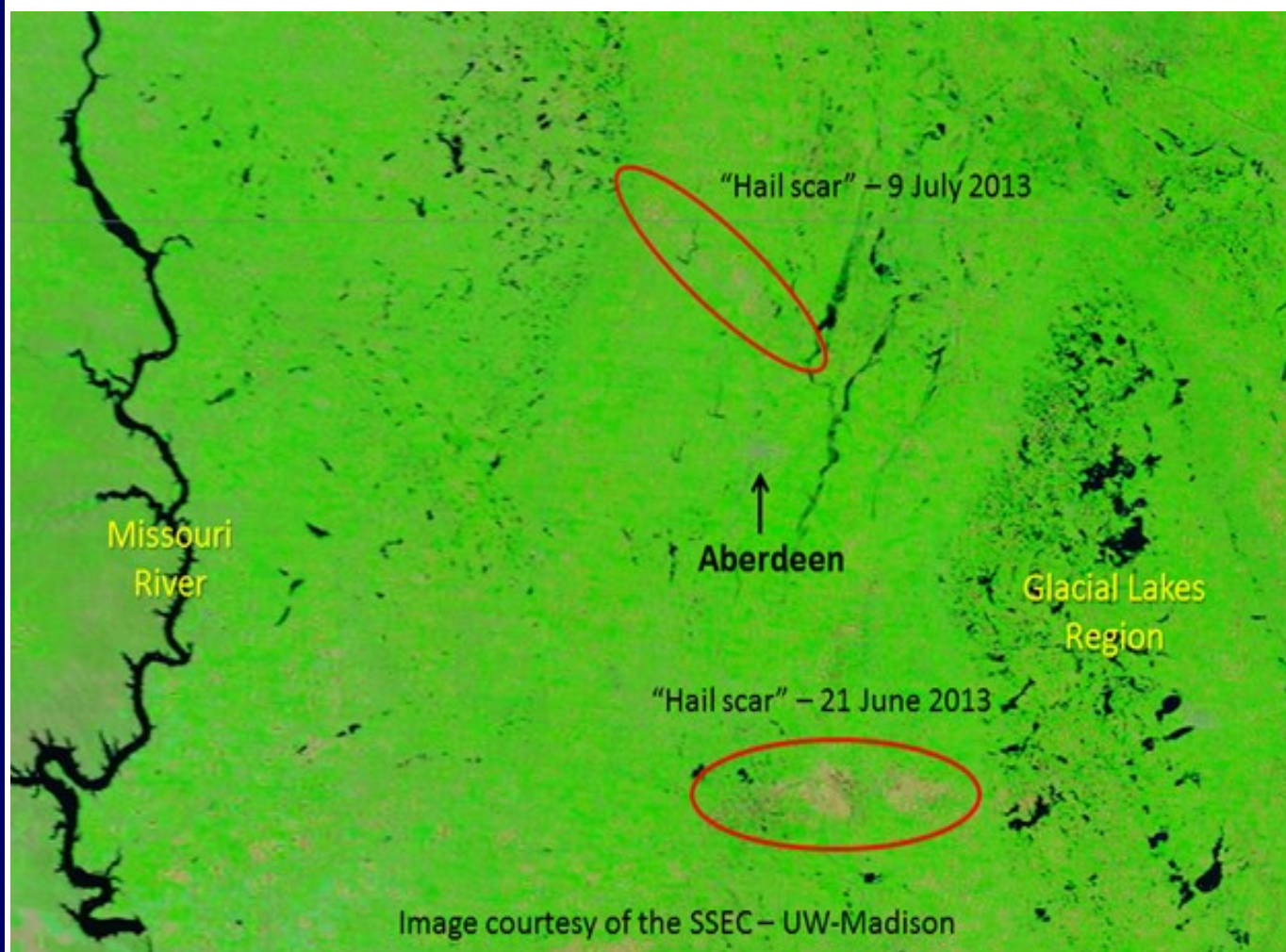
What are also interesting are the two areas of dull colors (brown/grey) amongst the green. These features are "hail scars" from two recent severe weather events - June 21st and July 9th. These swaths were produced by large, wind-driven hail which unfortunately damaged/destroyed the crops to the point where they are not as green as the surrounding healthy crops.

If you have comments/questions about this image - send them our way!

More info about the MODIS imagery can be found here:

<http://ge.ssec.wisc.edu/modis-today/about.html>.

MODIS "False Color" Satellite Imagery Wednesday, 17 July 2013



Relative Humidity vs. Dewpoint Temperature

As we approach what is typically the warmest part of summer, we end up talking more about how humid it is outside. But, what exactly is relative humidity, and is there a better way to determine how muggy it is outside? Enter the dewpoint temperature. First, we'll examine the difference between relative humidity and the dewpoint temperature before we go any farther.

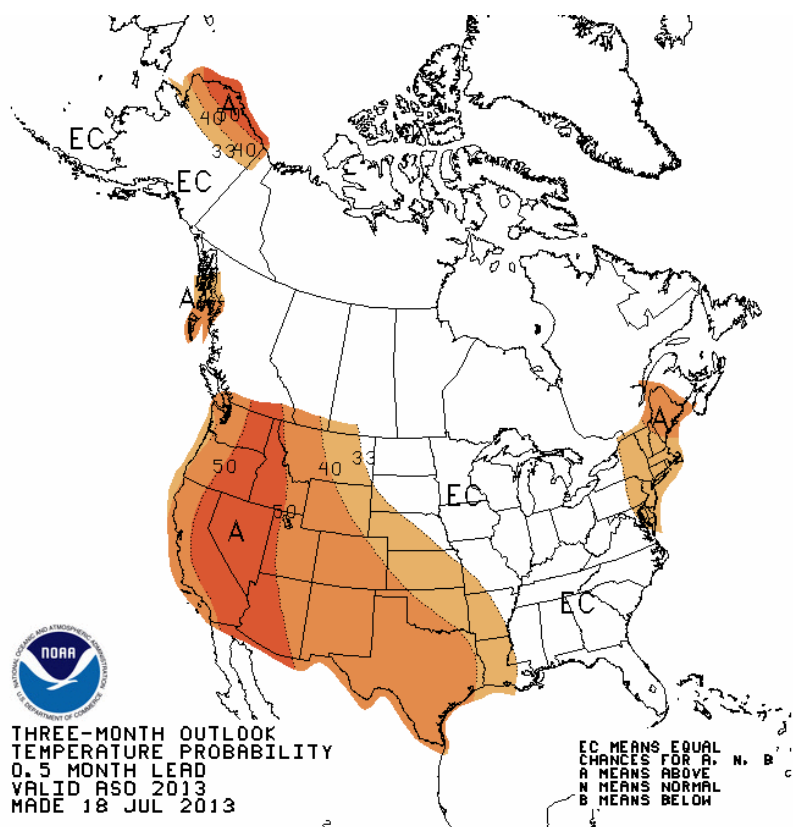
Relative humidity is exactly that, relative. It is completely dependent upon the outside air temperature and calculated from an equation. We have all seen instances where 50% relative humidity during the summer feels much worse than 90% relative humidity during the winter. On the other hand, the dewpoint temperature is a measurement of the moisture content of the air. Let's look at it a different way. Pretend that you have 50 of your closest friends stuffed into your kitchen. Things would be a bit cramped space wise. Now, take those 50 friends and instead put them into the local high school gym. Plenty of room, right? The kitchen and gym represent air parcels, while the people represent moisture. A "cold" air parcel is smaller than a "warm" air parcel, therefore it can't hold as much moisture. The kitchen above represents the "cold" air parcel, while the gym represents the "warm" air parcel. The friends are moisture and represent the dewpoint temperature. So even though we held the "moisture" constant, the relative humidity was higher in the kitchen simply because the moisture took up all of the available space. And, moving the friends to the gym resulted in a lower relative humidity, again because there was more space available, and we kept the moisture constant. The relative humidity is solely based upon the temperature of the air parcel. But, the dewpoint temperature is a measure of the moisture in the air. The higher the dewpoint, the muggier, or downright uncomfortable, it can become.

By definition, the dewpoint temperature is the temperature a given parcel of air must be cooled to for saturation to occur. When the dewpoint is in the 60s, it begins to feel a little sticky outside. When the dewpoint gets into the 70s, it can feel quite uncomfortable outside, especially if there is plenty of sunshine with very little wind. The next question is why it begins to feel increasingly uncomfortable with higher dewpoint temperatures.

Remember that the human body cools itself by sweating. The sweat evaporates off of our skin, resulting in a cooling effect. The more moisture a given air parcel contains, the harder it becomes to evaporate the sweat. Because the sweat doesn't evaporate, it may actually feel hotter than it actually is. This is where the Heat Index enters our discussion. The Heat Index is derived from an equation that takes into account the actual air temperature, the dewpoint temperature, and our body's ability to cool itself. A high heat index usually results from high outside air temperatures combined with high dewpoint temperatures. When the body has a hard time cooling itself, dehydration, heat exhaustion and heat stroke can result very quickly.

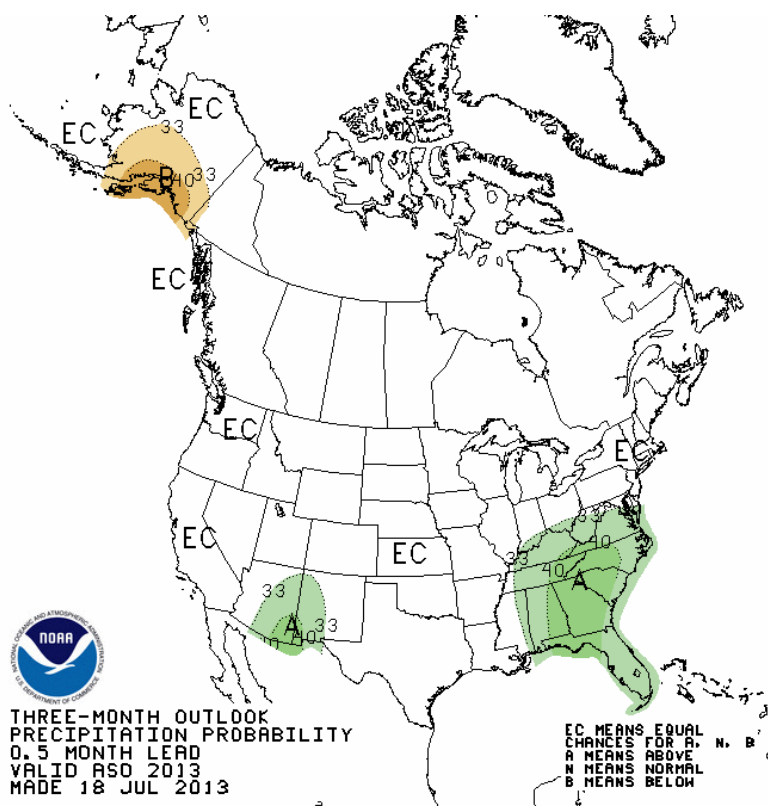
So, next time somebody begins to talk about how muggy it is outside, find out what the dewpoint temperature is. It will give you a better indication of how muggy it *actually* is outside.

Seasonal Outlook - August through October



Temperature Outlook for the
months of August through
October

Precipitation Outlook for the
months of August through
October



Heat Index Chart

		Temperature (°F)															
Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

■ Caution
 ■ Extreme Caution
 ■ Danger
 ■ Extreme Danger

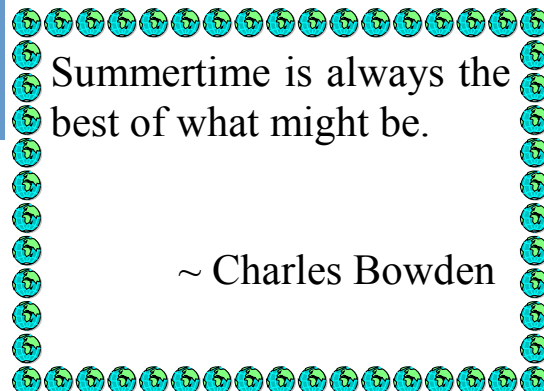
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